Irregular Tachycardia

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Vignette

The electrocardiogram shown in Figure 1 was obtained in a 76-year-old man with known ischemic heart disease who returns complaining of shortness of breath.

Questions

1) What is your interpretation of this electrocardiogram?

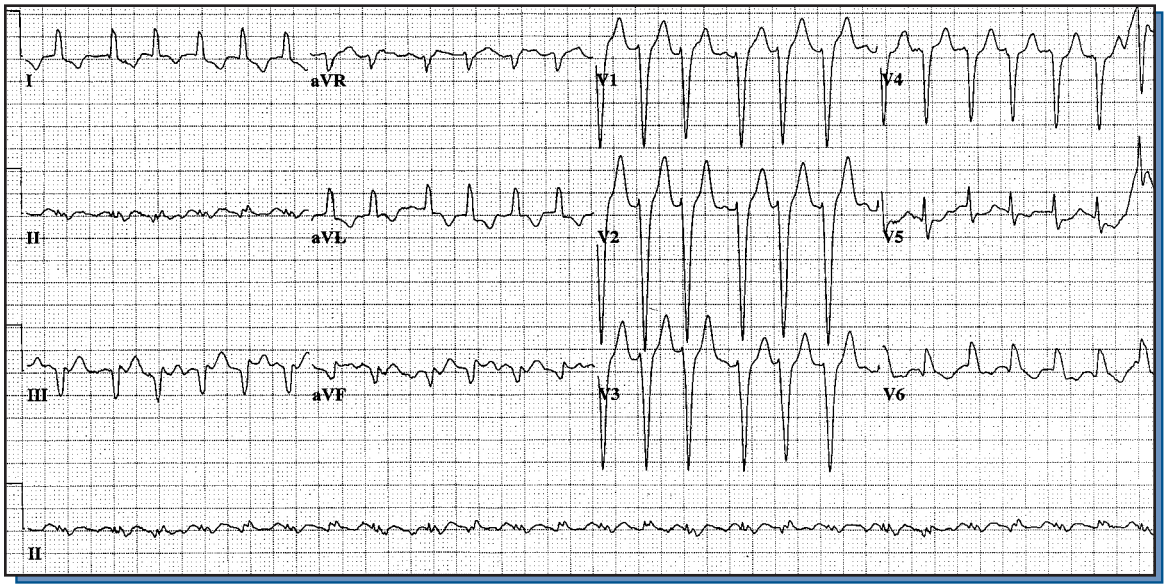

Figure 1

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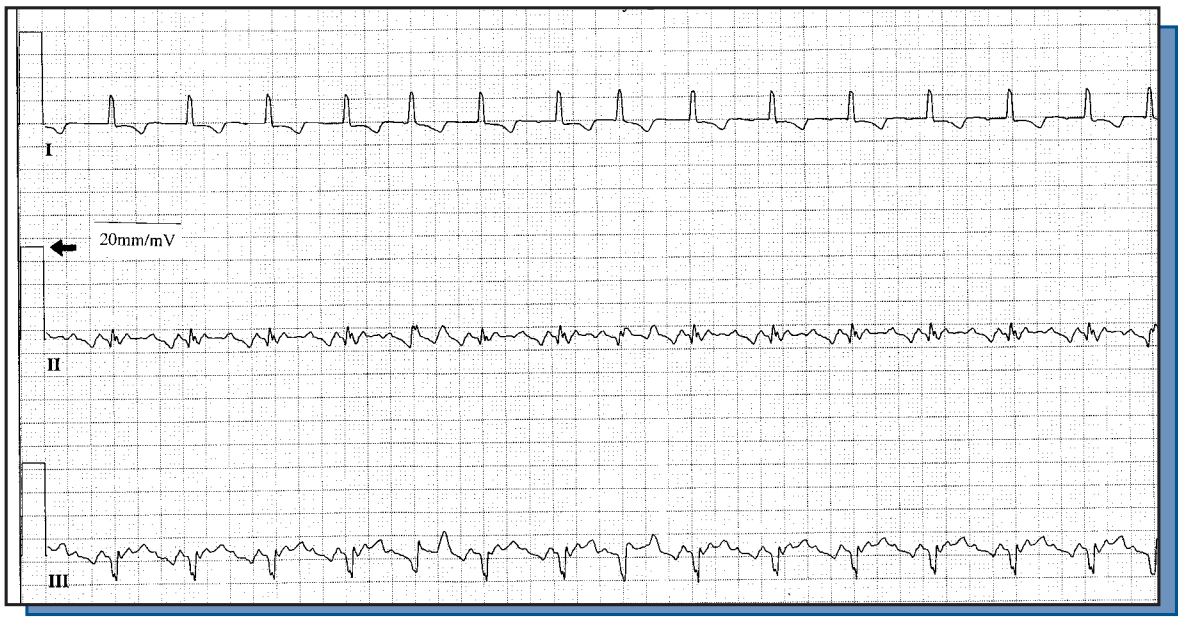

Figure 2

Answer

1) The 12 lead recording shows an irregularly irregular tachycardia with an average ventricular rate of about 150 beats per minute. The QRS complexes are borderline wide and there are Q waves in leads III, and aVF consistent with a prior inferior wall myocardial infarct. A superficial look at the recording might bring atrial fibrillation to mind, but attention to the rhythm strip at the bottom (lead II) shows that there are actually two superimposed rhythms, one of them regular, the other one irregular. The irregular one corresponds to the rhythm of the ventricles, which can be determined with confidence by referring to the simultaneously recorded QRS complexes in the 12 leads above, and has the appearance of small, sharp indentations. The superimposed rhythm is formed by waves of different configuration. They are easier to appreciate in the middle strip (lead II) of the rhythm leads recorded with double sensitivity setting (20 mm per millivolt) shown in Figure 2. Each cycle in this second rhythm is composed by two rounded waves of different polarity and its rate is 240 per minute. Its biphasic shape is strongly suggestive of a slowish atrial flutter, which is in fact one form of macro reentrant atrial tachycardia. Finally, the irregular ventricular response may be attributed to variability in the conduction through the AV node, a well known phenomenon in atrial flutter and fibrillation. Dx